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Discussion

Dr Paul H. Schipper *(Portland, Ore).* I would like to know more about how I can use this data set clinically, so I have 2 questions for you. The first question has to do with the 42-month or 3.5-year median interval between the first and second surgery. This is a retrospective case series, an inherent problem of which is that you are not the first person to screen the data. The data is in fact first screened by the surgeon who made the decision to operate or not to operate on this person a second time. I think the surgeons at the Mayo Clinic probably had a couple things in mind as they were making this decision. One is the Martini and Melamed criteria of a 2-year interval to consider something a new primary versus a recurrence. The second is that statistically most recurrences happen in that first 2 years, and the final is that at least I feel more comfortable with a trial of time. I can say to myself, okay, it has been 2 years and this is the only disease we see—let's apply this local therapy of surgery.

So, based on your data can you make any suggestions as to what I should do with a 1.5-cm lesion showing up 6 months or 1 year from the initial lesion? Do you think that this 3.5-year period is selecting for slower-growing, biologically less active tumors?

Dr Hamaji. Although Martini and Melamed in their original 1975 publication proposed that, for tumors of the same histology, a DFI of at least 2 years was required to be considered a metachronous lung cancer, we specifically eliminated the requirement of a DFI of at least 2 years when selecting patients for this study to be able to validate if that criteria is associated with survival. We did not find any association of DFI with survival, so if the patient is medically fit and can tolerate additional surgery and you believe that the second lesion is an MSPLC and not local recurrence or a metastasis, we would recommend surgical resection.

Dr Schipper. And that 3.5-year period? Maybe the patients that you are presenting to us have tumors that are less biologically active? Or in other words, these patients made it through that 3.5-year period. Maybe there is another subset of patients who did not and the surgeons at Mayo said to themselves, ''Your tumor showed up 6 months after an operation, this is an aggressive tumor, maybe I should not apply local therapy, maybe you would be better served with chemotherapy or radiation therapy.'' Those patients, therefore, did not make it into the study.

Dr Hamaji. We analyzed the DFIs of 2 years, 3 years, and 5 years, and compared patients with DFIs <2 years and patients with DFIs >2 years, and we did not find a significant difference in survival. We did the same analysis for the 3 years and 5 years patients, so we did not use the time range for patient selection. Our recommendation is unless the patient has ground-glass opacity we will be very aggressive for surgical management of the lung nodule.

Dr Schipper. So anywhere from 2 to 5 years after your first operation is okay, <2 years is still questionable? Would you agree with that?

Let me ask my second question. You talk about surveillance imaging and your conclusion is that you recommend surveillance imaging. One of the things you point out is that in your analysis of the patients who had surveillance versus those that did not, there was no difference in survival and that in a significant group of your patients the tumor was found by chance. Meanwhile, 100% of the patients you operated on were asymptomatic. Although I agree with the need for surveillance, I am curious as to how you came to that conclusion using your data.

Dr Hamaji. Before our analysis we expected that chest computed tomography (CT) surveillance would be superior to x-ray surveillance but actually we failed to show chest CT's advantage. The reason, we think, is because of our small number of patients. Theoretically chest CT is superior in picking up a smaller nodule, which we showed is a significant factor in better survival after a second lung cancer, so we recommend chest CT for surveillance.

Dr Frederic Grannis *(Duarte, Calif).* John Benfield, a former president of this organization, many years ago showed an enormous risk of second lung cancer and also head and neck cancer following treatment of a tobacco-related cancer. Based on that, we have been doing annual CT scans in all of our survivors for almost 30 years now. Jeff Lemont published that data and showed that the

surveillance benefit of a CT scan is very minor, but the screening benefit is enormous. We reported 85% detection of second lung cancers in stage 1A and 70% alive at 4 years.

Now to the question. The recent American Association for Thoracic Surgery meeting gave a guideline recommendation that we should be screening all patients with a first lung cancer and I agree with that, but we cannot tell from your data the characteristics of the patients who had a second lung cancer but were not operated on. Can you tell us how many such patients there were and what were the survival and screening characteristics of the other group of patients who were not operated on?

Dr Hamaji. We only analyzed patients who had second lung cancer surgery and we did not look into patients who were managed medically and we did not compare the 2 patient groups, so I do not have any information on the patients with MSPLC who did not undergo surgical treatment.